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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/531,699 | 10/06/2005 | Takeshi Matsumura | 529.44847X00 | 2227 |
| 20457 7590 08/22/2007 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873 | | | EXAMINER WEATHERBY, ELLSWORTH | |
| | | | ART UNIT 3768 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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| Office Action Summary | Application No. 10/531,699 | Applicant(s) MATSUMURA ET AL. | |
| | Examiner Ellsworth Weatherby | Art Unit 3768 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>1/10/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 10 is objected to because of the following informalities: Applicant refers to the wrong parent claim. Appropriate correction is required. For the purposes of examination the examiner is interpreting the parent claim of claim 10 to be claim 9.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1-3, 5-7, 13, and 16-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Von Behren et al. (USPN).

Von Behren et al. '324 teaches an ultrasound diagnostic apparatus comprising: a probe which is put onto an object to be examined for transmitting and receiving an ultrasound wave (col. 3, ll. 66-67; col. 4, ll. 1-6); means for generating and storing a tomographic image by receiving a reflected echo signal corresponding to the transmitted ultrasound wave (abstract); a unit for measuring a displacement of the

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object's tissue and calculating elasticity information from a reflected echo signal corresponding to an ultrasound wave while a pressure to be applied is changed when the probe is put on the object, and generating a color elasticity image from the elasticity information (abstract); means for generating a translucent image on the basis of image information of at least one of the tomographic image and the color elasticity image (col. 4, ll. 7-19); and means for selectively displaying the tomographic image, the color elasticity image, and the translucent image (col. 4, ll. 7-19). Von Behren et al. '324 also teaches that the translucent image generating means further includes means for overlapping the tomographic image generated by the tomographic image generating means and the color elasticity image generated by the elasticity image generating means to generate a translucent image on the basis of a desired overlapping ratio (col. 3, ll. 18-25). Von Behren et al. '324 also teaches generating a translucent image on the basis of the elasticity image generating means (col. 3, ll. 6-43). Von Behren et al. '325 also teaches that the overlaid display is generated as a linear combination of the gray-scale representation and the color representation, for example, with the visibility of the gray-scale and color representations, respectively, being functions of a *transmission coefficient*. The transmission coefficient may be fixed, set automatically, or made user-adjustable (col. 3, ll. 18-26). Von Behren et al. '324 also teaches variably scanning a ROI and means for creating color elasticity values from intensity values in respective portions of an ROI (claim 1). Von Behren et al. '324 also teaches that the image generating means includes a display address of tomographic and elasticity image data, and the image generating means assigns pixels to of the images to the display address

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and generating the image (col. 5, ll. 64-67; col. 6, ll. 1-48). Von Behren et al. '324 also teaches that the image provided yields gain information (col. 5, ll. 18-35).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von Behren et al. '324 in view of Sarvazyan (USPN 5,678,565).

Von Behren et al. '324 teaches all the limitations of the claimed invention except for expressly teaching that the translucent image generating means further includes pressure measuring unit attached to the probe for measuring information of the pressure applied to the object, and generates translucent image data by setting a desired combination ratio using the tomographic image data calculated by the tomographic image generating means on the basis of the pressure information measured by the pressure measuring unit.

In the same field of endeavor, Sarvazyan '565 teaches a pressure measuring unit attached to a probe for measuring information of the pressure applied to the object

where image data is acquired on the basis of the pressure information measured by the pressure measuring unit (abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Von Behren et al. '324 in view of Sarvazyan '565. The motivation to modify Von Behren et al. '324 in view of Sarvazyan '565 would have been to directly measure pressure that is applied to the body during the sonoelastography procedure.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Von Behren et al. '324.

Von Behren et al. '324 teaches all the limitations of the claimed invention except for expressly teaching that the display means further includes means for selectively displaying a numerical value of either combination ratio of the elasticity image or that of the tomographic image. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Von Behren et al. '324 to include a numerical value of either combination ratio of the elasticity image or that of the tomographic image to aid the user in making adjustments.

7. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von Behren et al. '324 in view of Sarvazyan '565.

Von Behren et al. '324 teaches all the limitations of the claimed invention except for expressly teaching that the translucent image generating means further includes an outline detecting means for detecting a borderline between tissues having different

elastic behavior in the color elasticity image on the basis of the set threshold of the elasticity information calculated by the elasticity image generating unit and means for generating a combined image of the detected outline and the generated tomographic image.

In the same field of endeavor, Sarvazyan '565 teaches detecting the difference in the elasticity modulus between a tumor and surrounding tissue, the more substantial change in the pressure profile ratio for a given diameter tumor and the more easily the tumor will be detected. As an indication of sensitivity, one can observe a line crossing a threshold level of sensitivity (indicated by the dashed line at 39) indicating that detection of a tumor in the range of 1 mm can be made. When an elasticity modulus ratio is 2 (curve 40), one can observe that a tumor of 2.5 mm in diameter (d) could be detected (fig. 9; col. 9, ll. 3-28). Sarvazyan '565 also teaches changing the outline line type of the borderline on the basis of the elasticity information calculated by the elasticity image generating means (col. 6, ll. 15-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Von Behren et al. '324 with Sarvazyan '565. The motivation to modify Von Behren et al. '324 in view of Sarvazyan '565 would have been to clearly identify regions of different elasticity in the tissue elasticity evaluation.

8. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von Behren et al. '324.

Von Behren et al. '324 teaches all the limitations of the claimed invention except for expressly teaching that the display switches the stored tomographic image information and elasticity image information to selectively display them on the display unit. Von Behren et al. '324 also does not teach setting a timing of arbitrarily switching the stored image data. However, It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Von Behren et al. '324 to arbitrarily switch the timing of switching the data to display each image type to provide each type of image to the user during a procedure.

9. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Von Behren et al. '324.

Von Behren et al. '324 teaches all the limitations of the claimed invention except for expressly teaching that the display address calculating means performs calculation so as to display the tomographic image data and the color elasticity image data in a striped pattern. Von Behren et al. '324 also does not expressly teach that the display address calculating means performs calculation so as to display the tomographic image data and the color elasticity image data in a check pattern. However, at the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to display the image data in a striped or check pattern because Applicant has not disclosed that displaying the data in a striped or check pattern provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected the device of Von

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Behren et al. '324, and applicant's invention, to perform equally well with either display taught by Von Behren et al '324 or the claimed striped or check display because each display type would perform the same function of accurately providing information to the operator.

Therefore, it would have been prima facie obvious to modify Von Behren et al. '324 to obtain the invention as specified in claims 14 and 15 because such a modification would have been considered a mere design consideration which fails to patentably distinguish over the prior art of Von Behren et al. '324.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ellsworth Weatherby whose telephone number is (571) 272-2248. The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eleni Mantis-Mercader can be reached on (571) 272-4740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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